Chapter 1

Introduction and outline of this thesis

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The studies described in this thesis focus on components of bone that contribute to its resistance to fracture, often referred to as bone quality, in patients who are considered at risk for secondary osteoporosis. The objectives of these studies were:

1. What is the fracture risk profile in patients at risk for secondary osteoporosis, based on clinical risk factors for fractures and parameters of bone's resistance to fracture, including bone mineral density (BMD), quantitative ultrasound (QUS), bone turnover markers and morphometry of the vertebrae
2. What is the relation between disease characteristics (including treatment) and these parameters of bone's resistance to fracture
3. What does follow-up add to the assessment of the fracture risk profile

To this end, studies were performed in patients treated with a suppressive dose of levothyroxin because of differentiated thyroid carcinoma, inflammatory bowel disease and sarcoidosis. In these patient groups BMD was measured with dual-energy X-ray absorptiometry (DXA) and QUS. In addition, the bone turnover parameters of resorption, serum carboxy-terminal cross-linked telopeptide of type I collagen (ICTP), and formation, serum procollagen type I amino-terminal propeptide (PINP), were determined. Clinical risk factors were evaluated following a standard questionnaire and disease activity parameters according to standard evaluation procedures for each disease. An assessment of the prevalence of non-clinical morphometric vertebral factures was done on the basis of semiquantitative morphometric analysis of DXA-images of the spine.

In chapter 2 general aspects of osteoporosis are summarized as far as relevant for the studies performed within the framework of this thesis. Chapter 3, 4 and 5 describe the observations done in cross sectional studies in patients with respectively thyroid carcinoma, inflammatory bowel disease and sarcoidosis. Chapter 6 concerns a follow-up study in patients with sarcoidosis to determine the effects on BMD and the incidence of morphometric vertebral deformities in the course of this condition. Chapter 7 comprises the observations made with QUS in patients with inflammatory bowel disease and sarcoidosis and discusses the value of this technique in the screening of patients with an increased risk for vertebral deformities. This thesis is concluded by a general discussion of the main findings of the studies performed and by recommendations for further investigations.